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SCIENCE ROLES: DECISIONS IN THE WILDERNESS

I'm delighted to be here with such an expert panel and knowledgeable audience talking about science, about land use, and about their relationship to wilderness.

I do not intend to dwell on the semantic variations of what is or isn't wilderness. We've all seen various definitions, and if we boiled them all down together, we would probably find a consensus definition that wilderness is a place where man has made an insignificant impact on the ecosystem.

For example, the Wilderness Act tells us that, "A Wilderness, in contrast with those areas where man and his own works dominate the landscape, is hereby recognized as an area where the earth and its community of life are untrammeled by man, where man himself is a visitor who does not remain."

You may prefer the more facetious definition of wilderness as a place "where the hand of man has never set foot." Or perhaps you'll settle for the pragmatic approach: wilderness is whatever the U.S. Congress designates as wilderness. Regardless of how anyone defines it, wilderness is one of the original land uses.

If we read the book of Genesis, we find that, at the Biblical beginning, man's influence on the land was confined to a relatively small "Garden of Eden." Certainly the rest, being devoid of man's influence, would fit our definitions of wilderness.

In centuries since, we have employed a full spectrum of environmental modifications to meet human needs. We've carved our many niches from the wilderness, building cities and growing crops where the wilderness once stood.

Remarks prepared for delivery by Dr. M. Rupert Cutler, Assistant Secretary of Agriculture for Conservation, Research, and Education, before the Pacific Div. American Assn. for the Advancement of Science, Moscow, Idaho, June 5, 1979

The influence of man now extends to the far reaches of the earth. We find man-made pesticides in the birds of the Arctic, pollutants in oceanic canyons, and man-caused climatic changes in the most isolated of areas. Is there such a thing today as a wilderness devoid of man's trace?

Probably not. Unlike Biblical times, we have now developed the land to meet our needs and wants; there remain only a comparative few gardens--a few wildernesses--where man's influence is relatively insignificant.

And the existence of these wildernesses today has been due as much to man's inability to develop them as to our deliberate efforts to preserve them.

Great swaths of wilderness exist primarily because we haven't converted them to other significant use or because man's activities in some of them ceased long ago and have since been obliterated by natural renewal.

We have the Mt. Everests of the world, for example, the large deserts and dense jungles, and the Arctic and Antarctic. And we have a large amount of renewed wilderness--blocks of forest or agricultural land which haven't felt the axe or plow for decades. These are undesignated wilderness, but wilderness nonetheless.

Many nations have designated wilderness areas. In the United States especially, Federal and State governments have set aside many wilderness areas, thereby protecting them from significant human influence associated with other land uses.

At risk of confusing the matter, some Research Natural Areas are included in this general category of designated wilderness. Many of these areas, set aside for research, are protected from significant human interference. In a generic sense, they are wilderness, though they are subject to a different purpose and a much simpler and less controversial designation procedure than is involved in Congressionally-designated "big W" Wilderness.

The last two decades--even the past year--have seen significant progress in preserving wilderness in this country.

As it stood last week, there are some 19 million acres of Congressionally-designated Federal Wilderness, including 15.3 National Forest acres in the National Wilderness Preservation System.

President Carter has proposed adding to this system, 15.4 million National Forest and Grassland acres which were identified through RARE II. And the Alaska lands' legislation, plus studies under way in the Department of the Interior will lead to other significant additions to this wilderness acreage.

I understand that Secretary of the Interior Andrus mentioned a possible total Federal Wilderness of 118 million acres when he spoke here in April. He was including the RARE II wilderness acreage and other areas recommended for wilderness, plus 50 million acres of Alaskan wilderness, and all of the 10 1/2 million RARE II acres we've slated for further study.

That sounds on the low side to me. The Udall-Anderson Alaska lands legislation alone would create 68 million acres of wilderness. And I see between 33 and 43 million acres of wilderness in the National Forests and Grasslands, not to mention the wilderness opportunities available to the National Park Service, Fish and Wildlife Service, and Bureau of Land Management in the "Lower 48" states. The Bureau of Land Management alone has about 120 million acres of roadless and undeveloped areas outside the Alaska lands legislation, which it may review for possible wilderness designation.

There are also significant state wilderness acreages in the United States. Nine states have established wilderness systems, and more than 20 states have enabling wilderness legislation. New York, for example, constitutionally mandated state wilderness in 1885, and now has about a million

acres in 16 separate areas. California has 97,000 acres in two state wilderness areas. And I am personally quite familiar with the Michigan "Wilderness and Natural Areas Act," passed in 1972, under which that state has designated some 44,000 wilderness acres.

We have 393 Research Natural Areas (RNA's) on federally-administered lands in the United States, covering about 130,000 acres. And we are continuing to add to the natural ecosystems which are represented in the natural areas system.

I'm sure you realize that this Federal effort is only part of what is being done to set up natural areas. The Nature Conservancy has an outstanding natural areas program, and so do professional societies such as The Society for Range Management and the Society of American Foresters.

As I noted before, I've included these RNA's under the general heading of wilderness, because one of our objectives in setting these areas aside is to maintain representative natural processes away from interference by man. That's also a feature of "big W" Wilderness designated under the Wilderness Act and subsequent legislation.

The underlying emphasis in these RNA's, though, is on scientific study. Public use and enjoyment of these areas is generally discouraged.

You know that's quite different from "big W" Wilderness, where the emphasis is heavily upon wilderness recreation and experience, and research is generally a secondary or supplemental use.

RNA's are selected by ecological criteria to provide representative samples of the natural environment. Their natural features have generally had a minimum of disturbance by man, and they are assured the greatest possible degree of preservation and permanency.

To the degree that designated Wilderness shares these characteristics of RNA's, it also shares their value to science.

Both Wilderness and RNA's serve as gene pools--as reservoirs of natural diversity. At this gathering of scientists, I'm sure you recognize the value of preserving natural diversity—its role in the biological checks and balances which stabilize ecosystems, its importance as a storehouse of potential new natural materials or its resource options, and human psychological value as an alternative to monotony.

Second, both RNA's and Wilderness serve as an environmental baseline. Aldo Leopold called it, "a base-datum of normality, a picture of how healthy land maintains itself as an organism." He declared that each biological province "needs its own wilderness for comparative studies of used and unused land." RNA's and wilderness provide indicators of man's influence on the environment, such as biological change caused by water and air pollution.

Third, these areas are a refuge for the survival of species which are especially sensitive to man's influence. They help protect some rare and endangered plant and animal species from extinction due to man's interference with their natural habitat.

In 1965, a study committee of the American Association for the Advancement of Science pointed out the urgency of research in areas where natural processes are allowed to predominate without deliberate manipulation or accidental interference by man. Both wilderness and RNA's provide opportunity for this type of research.

There are some research studies, though, such as those of large-scale ecosystems, of wildlife that wander an extensive range or of phenomena on large watersheds for which RNA's are too small. For studies of this type in essentially unmodified ecosytems, designated wilderness areas can be the best setting, provided public use hasn't diminished their research value.

For example, Wright found that some 500,000 acres of the Boundary Waters Canoe Area have never been significantly affected by modern civilization. He determined that they provided a unique laboratory for the study of large-scale ecological processes.

Some studies, of course, simply require wilderness as a laboratory. It would be difficult for example, to study the interrelationships among wilderness, wildlife, and wilderness visitors outside of a wilderness. That type of study is immensely valuable to wilderness management.

For many types of wilderness research we should ideally have representive areas of all the major forest, range, or wildlife habitat ecosystems, provided they are available in a wilderness condition. We fall far short of that ideal, primarily because wilderness is generally not designated by ecological criteria. The problem is that the same few high-elevation natural communities tend to be available in various wilderness areas, and there is a shortage of the intermediate and lower elevation ecosystems, most of which have been already overrun by human activity.

As part of the RARE II process, we sought to correct some of this inadequate representation, thereby increasing the diversity of the National Wilderness Preservation System. We combined a map of the potential natural vegetation of the United States with a map of ecoregions, to identify 241 separate ecosystems in the United States. About 105 of these ecosystems contained National Forest System roadless areas which we evaluated through RARE II.

As we drew up the RARE II proposal on how these and the other roadless areas would be allocated, we tried to recommend wilderness designation for roadless areas in ecosystem types which weren't already represented in the National Wilderness Preservation System. This is a process similar to that used

to select new additions to natural areas systems. As Congressional Committees consider our RARE II recommendations, I hope they will recognize the value and logic of this approach.

Earlier I reviewed some of the progress we've made in wilderness preservation in the United States and projected how much Federal wilderness we might eventually have.

We have wilderness, and we will have more wilderness, because people want it. Because they enjoy or would like to enjoy a wilderness experience. Because they value the renewal of spirit which wilderness can provide. Or because they simply like to know that wilderness, with its associated plants and animals, is there. The allocation of land to wilderness use has relatively little to do with the value of wilderness to science.

Yet I have outlined the scientific value of wilderness--a value partially shared with RNA's, yet partly unique to "big W" Wilderness.

My point in doing this is that science has a very great stake in the future and the natural integrity of wilderness. At a time when wilderness visitors are beginning to love some wilderness areas to death, and when the soils and vegetation on many areas cannot continue to bear the degree of punishment they've been receiving -- the natural integrity of some areas is endangered. We must actively manage human use of the wilderness resource.

That will require skills and knowledge which we don't have yet. Research has already provided successful wilderness management techniques. As the pressure and wear on these wilderness areas increase, new approaches will be needed. We will need an expanded wilderness research program to develop them and to answer some of the wilderness management questions which are already emerging.

Let me list some of these researchable questions: The first is: What is it that the people who seek out wilderness are looking for? Is it solitude? Natural integrity? Scenic quality?

This basic information is closely connected to the second and third researchable questions: What is it about wilderness areas which provides these desired experiences, and how do we select and manage wilderness to provide them?

Wilderness managers need to know why visitors go to wilderness. And they need to know the consequences and public acceptability of various wilderness management techniques that may be necessary to optimize wilderness values and benefits.

A fourth question might be: What factors cause wilderness visitors to follow behavioral patterns which are ultimately demaging to the wilderness resource? The fifth: How do we indirectly overcome these factors to protect the resource?

These are practical questions which are important to the natural integrity and solitude of wilderness.

What is it which prompts wilderness users to pitch their camp at the waters' edge, rather than back out of the sight of other visitors? How do we lead them away from the water without making them feel regimented? The basic question is: How do we protect the wilderness without destroying the wilderness recreation experience.

The sixth researchable question is aimed more at the biological nature e of the wilderness resource: What are the natural conditions of wilderness, and in which direction are ecological processes moving them? This is related to the value of wilderness as an environmental baseline, which I referred to earlier. We need studies to establish baselines of natural conditions, if we are to then use those conditions to determine the impact of man on the environment.

Studies of historical patterns of plant succession and fire history, for example, have indicated that exclusion of natural wildfire from the wilderness has led to unnatural conditions in some ecosystems which are fire-dependent. That knowledge has enabled us to carefully restore fire to its natural roles in these wilderness ecosystems.

A final researchable question is: How do human activities outside the wilderness areas affect the natural processes of the wilderness itself?

In New York State, for example, we have noted an increased acidity of the rainfall, and subsequent decline in fish populations of inland lakes. In studying the situation, we found that, as a result of burning fossil fuels, where the dioxides turn to nitric and sulfuric acid in precipitation, the rain in the United States is becoming more acid. Rain has an average ph of 5.6, but we have recently found an average ph of 4 in eastern rainfalls. Other Nations have experienced this problem. As a direct result of acid precipitation, 75 percent of the lakes in Sweden no longer support any fish life. We need to study this type of external influence on wilderness in the United States. Without such research we can no longer maintain that wilderness ecosystems haven't been significantly influenced by man.

This is a short list, but we will probably never reach the end of it. As human populations grow, and human needs and wants multiply accordingly, other researchable questions will rise and need answers. We have a mutual stake in the scientific institutions which can provide them.

We have made significant progess in wilderness preservation in the United States, and that progress must and will continue at a pace determined by public demand.

Yet we are already engaged in the more difficult task of designing sound working principles for wilderness management. Our success here is critical to the continued value of wilderness as a scientific resource, as well as a recreational and spiritual resource for all.

In that task, there is plenty of opportunity for your dedication and ingenuity in that effort.

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